

## MONITORING OF THE PEREGRINE FALCON *FALCO PEREGRINUS* IN FINLAND

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The number of breeding Peregrine Falcons declined catastrophically in the 1950s and 1960s, reaching a minimum of about 30 pairs in the early 1970s. Since then the species has recovered considerably in the northern half of Finland but not in the south. Since the mid-1990s all previously known nest-site have been controlled at least in July to record nesting success, and new territories have been searched for actively. In total, 213 territories have been occupied at least once during the last five years. Over 90% of the Peregrine Falcons nest on the ground in extensive and wet peatlands. The average number of nestlings (over 30 days of age) per occupied territory has been 1.16 per occupied territory 1993–2005, and the respective figure per successful nest has been 2.33.

*Key words:* Peregrine Falcon, monitoring, methods, Finland, distribution, breeding success.

**МОНИТОРИНГ САПСАНА (*FALCO PEREGRINUS*) В ФИНЛЯНДИИ. Т. Оллила.** Служба лесов и парков Финляндии, Рованиеми, Финляндия.

Численность гнездящихся сапсанов *Falco peregrinus* в Финляндии катастрофически сократилась в 1950–60-е гг., и к началу 70-х гг. достигла минимального значения примерно в 30 пар. К настоящему времени, вид в значительной степени восстановил свою численность в северной половине Финляндии, но не на юге. Начиная с середины 90-х гг. все ранее известные гнезда проверяются как минимум раз в год – в июле, для регистрации успешности гнездования, а также ведется активный поиск новых гнездовых территорий. В целом, 213 территорий занимались сапсаном хотя бы раз за последние пять лет. Более 90% гнезд сапсана располагаются на земле, среди обширных влажных торфяников. В период с 1993 по 2005 г. на одну занятую территорию в среднем приходилось 1,16 птенцов (старше 30 дней), а на одну успешно гнездящуюся пару – 2,33 птенца.

*Ключевые слова:* сапсан, мониторинг, методы, Финляндия, распространение, успешность размножения.

### INTRODUCTION

The breeding population of the Peregrine Falcon *Falco peregrinus* crashed in Finland in the 1950s and 1960s due to pesticides, as a part of the global collapse of this cosmopolitan raptor species. The population, distributed all over Finland, was estimated at 500–1000 pairs before the pesticide era, but in the early 1970s probably no more than 30 pairs were left (Väisänen et al. 1998). The species has been classified as endangered in Finland since 1985 (Rassi et al. 2001). The Peregrine Falcon is listed in Annex I, a species in need of special protection, in the EU Birds Directive.

In this report I present briefly survey methods of the nation-wide monitoring project by Metsähallitus, the governmental organization responsible for monitoring and management of the most threatened raptor species in Finland. I describe also the distribution, size and productivity of the population.

The Peregrine Falcon has recovered considerably in the northern half of Finland during recent decades, mostly because use of the most harmful pesticides was stopped already in the 1970s. How-

ever, new types of chemicals, like bromide flame retardants, may pose a threat to top predators like the Peregrine Falcon in the future. In addition, the species has not been able to resettle in the south so far, in spite of range expansion in the north. Drainage of peatlands and other land use has had negative effect on Peregrine Falcons locally, but it cannot explain the total disappearance of the southern subpopulation since the 1960s.

### MATERIAL AND METHODS

Nation-wide monitoring of the Peregrine Falcon was started at the beginning of the 1960s by Finnish Nature Conservation Society (Linkola 1959), as a result of the catastrophic population decline. WWF Finland took responsibility for monitoring from 1970 to 1997 (e.g. Wikman 1993), and since then Metsähallitus has organized the project (e.g. Ollila 2000). During all these years voluntary bird ringers and other ornithologists have taken care of the main part of field work, with about 15 active participants at present.

All known territories have been visited at least once during the breeding season, normally be-

tween 5<sup>1</sup>–25 July. Due to limited resources, only very few territories have been controlled twice a year, which is a weakness in the monitoring programme – some unsuccessfully breeding pairs, for example, have probably remained unnoticed. The efficiency of searching for unknown territories and new nests in previously known breeding localities has remained fairly high and stable in recent years, but it has varied in earlier times. Continuous looking for new pairs and nest-sites is a necessity for reliable monitoring of an increasing Peregrine Falcon population. I estimate that we know now about 80% of all territories in Finland.

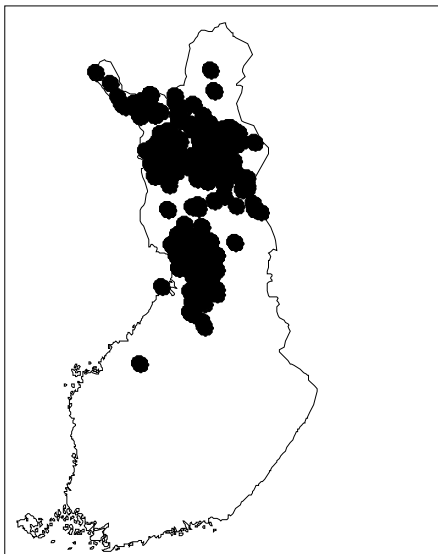
A territory has been classified as occupied if successful breeding or breeding attempt was observed, or a nest with fresh traces of Peregrine Falcons was found, or if a pair was seen during the breeding season. A nestling aged over 30 days has been classified as "old". The terms follow those proposed by Postupalsky (1974) and Steenhof (1986).

About 80% of all found young have been ringed yearly. We have a preliminary plan to start colour ringing of nestlings in the year 2007, integrated with the Swedish programme.

## RESULTS AND DISCUSSION

### Numbers and distribution

The total number of territories occupied by Peregrine Falcons since the 1970s is 276, and about 80% of them have been found in Lapland (fig. 1.). Of these territories 213 have been occupied during the last five years. The first successful breeding since the year 1970 in Central Ostrobothnia, western Finland, was recorded in 2005, which is one of the first signs of possible recovery of the extinct southern subpopulation.



**Figure 1.** Distribution of the Peregrine Falcon in Finland in 2005.

The number of known territories has increased markedly during the last ten years. In addition to the real increase of the population, a significant reason for this is the improved efficiency of field work; many previously missed territories have been found not until recently. Most of the falcons breed in remote and extensive *aapamires*, very wet peatlands, from northern Ostrobothnia to Central Lapland, the rest in fjell regions further north. Only very few pairs nest near human habitation. The distance between nearest neighbours varies a lot depending on the availability of suitable breeding and hunting habitats.

More than 90% of all nests lie on the ground in peatlands. In fjell regions Peregrine Falcons nest on cliff ledges. Every year some nests (3–5) have been found in trees, in old twig-nests of the Osprey (*Pandion haliaetus*) or the White-Tailed Sea Eagle (*Haliaeetus albicilla*). In the year 2005 the first breeding was found in an old Raven's *Corvus corax* nest.

### Reproduction

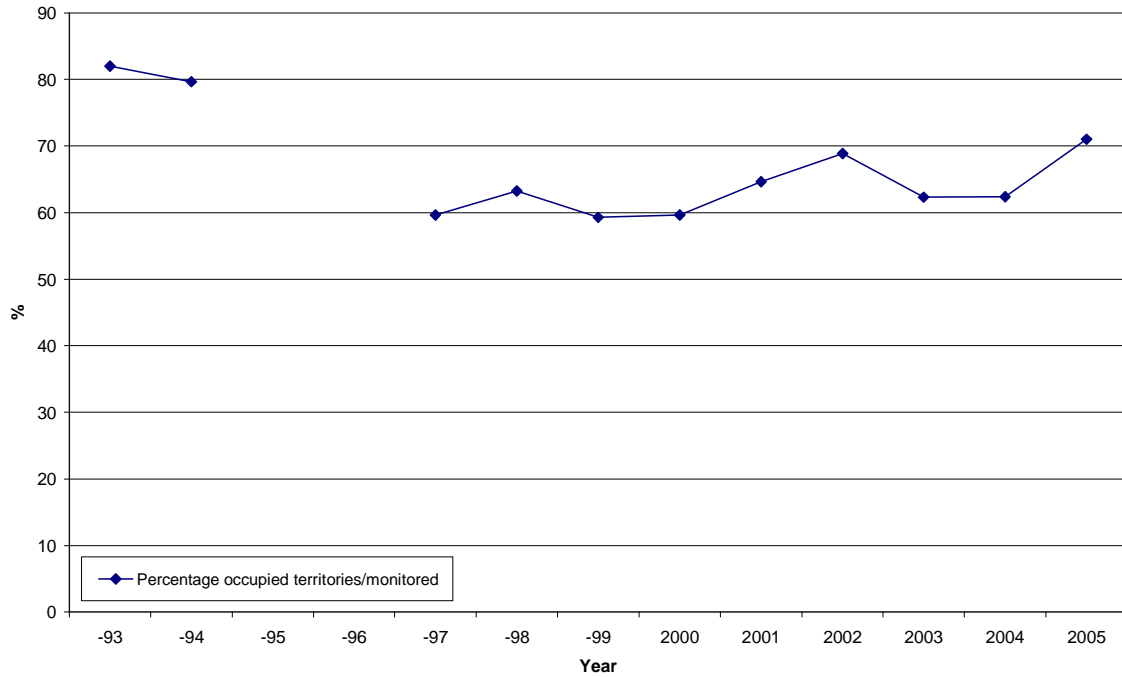
Peregrine Falcons have been found, on average, in 63% of all territories visited from 1993 to 2005 (annually 59–82%, fig. 2). This percentage was higher in 1993–1994 than later, because in those former years observers concentrated their field effort relatively more often in occupied territories, while after that all previously known territories, whether regularly occupied by falcons or not, have been controlled.

Abundance of prey species and weather conditions have a strong effect on reproductive success of the Peregrine Falcon, especially during incubation period from mid-May to mid-June. These natural variables explain a high proportion of the annual variation in the mean number of old nestlings. The most important prey species in Finland are waders, ducks and gulls.

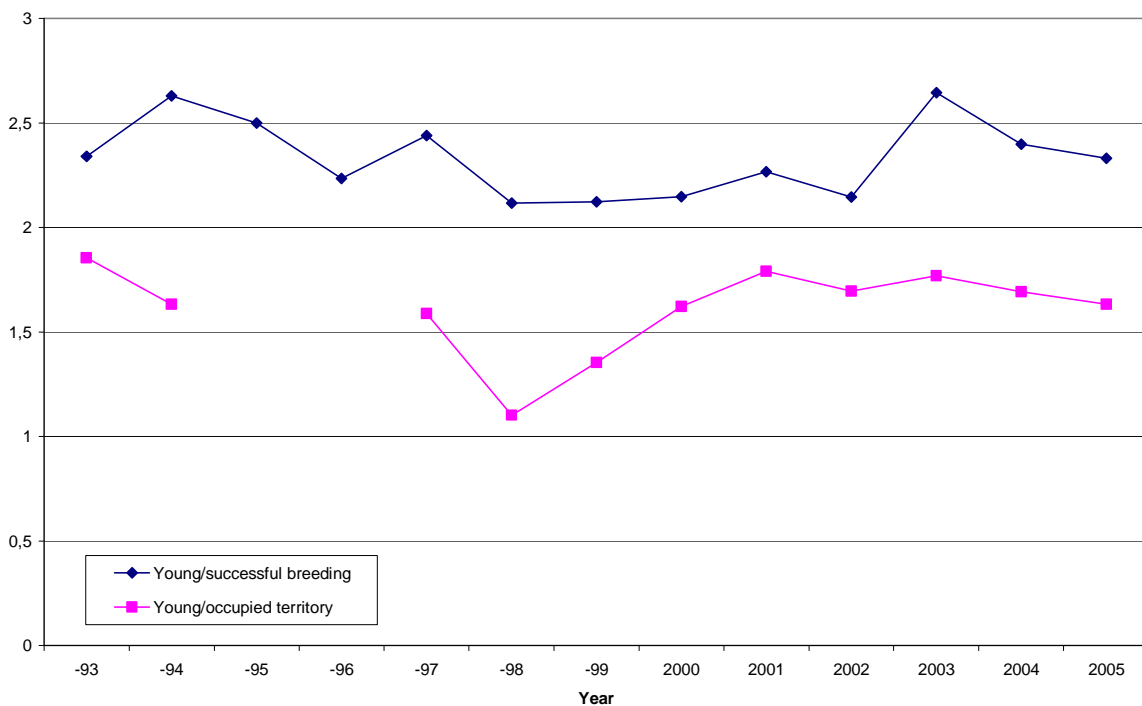
The average number of old nestlings per occupied territory has varied from 1.10 to 1.85 in the period 1993–2005 (mean 1.61). The data from the years 1995 and 1996 are not comparable with other years due to too low activity in the field work. The number of nestlings per successful breeding has varied from 2.12 to 2.65 (mean 2.33), respectively (fig. 3). Breeding success seems to be higher on cliffs than on the ground, but there is no marked variation between different parts of the Finnish range.

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**Figure 2.** Percentage of occupied territories in Finland in 1993–2005.



**Figure 3.** Breeding success of the Peregrine Falcon in Finland in 1993–2005.

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